RAINFALL OF MASAYA AND GRANADA, NICARAGUA. annual rainfall for 1897 was 123.43 inches, or the greatest By A. J. HENRY, Chief of Division.

Dr. Earl Flint, for many years voluntary observer of the Smithsonian Institution and the Signal Service, and the present correspondent of the Weather Bureau for Rivas, Nicaragua, furnishes the following table of rainfall, as observed by Mr. Cline.

Masaya is in latitude 12° 2′ N., longitude 86° W.; Granada is in latitude 12° N., longitude 85° 56' W. Observations were made by Mr. William Cline, civil engineer, at Masaya, from 1886 to 1896, and at Granada for the remainder of the time. Nothing is known of the kind of gauge used or its exposure, but from the professional standing of the observer and the general agreement between the recorded amounts and those obtained by Dr. Flint at Rivas (latitude 11° 26' N., longitude 85° 47' W., elevation, 200 feet above sea level), it is concluded that the series is reliable.

The rainy season at Masaya, as elsewhere in Nicaragua, begins in May and ends in the latter part of October. December, January, February, and March are almost destitute of rain, less than 2 per cent of the annual fall occurring in those months.

The greatest fall in any year was at Granada, in 1897 93.62 inches, or 162 per cent of the mean fall; the least fall of any year was at Masaya, in 1890, 20.52 inches, but 35 per cent of the mean fall. Such a disproportion between the amount of rain in the year of minimum rainfall and the mean is rarely observed. The variation in the fall of the same month in different years is even greater. The short dry season in the middle of summer, which is a characteristic of the rainfall of portions of Central America, is not well marked at Masaya; in some years heavy rain is continuous from May to November.

Monthly and annual amounts of rainfall at Masaya, 1886-1896, and Granada, 1897, Nicaragua, in inches and hundredths.

Year.	January.	February.	March.	April.	Мау.	June.	July.	August.	September.	October.	November.	December.	Annual.
1886 1887	0.30	0.00	0.00	0.00		10.78	8.29 7.89	5.74	15.34 9.15	11. 19 23. 56	0.69 0.94	0.02	*72.70 61.22
1888 1889 1890	0.05 0.00 0.14	0.14 0.00 0.00	0.00 2.89 0.00	0.00 1.18 0.60	6,43 1,82	12.09 17.00 3.00	4.95 7.87 2.86	13.43 2.66	17.21 14.53 2.95	7.67 13.36 5.89	0.00 2.34 0.42	0.00 0.25 0.18	58.70 78.78 20.52
1891 1892 1893	0.19 0.00 0.00	0.00 0.00 1.15	0.00 0.00 0.00	1.02 0.00 0.00	0.48 7.36 9.26	20.94 14.42 11.78		4.20 6.75 15.82	10.40 9.64 12.67	5.45 15.71 6.51	2.78 1.66 2.70	0.00 0.30 1.50	49.98 64.54 72.86
1894 1895 1896	0.32 0.00 0.23	0.50 0.00 0.00	0.00 0.00 0.00	0.00 0.41 0.09	7.87 4.57 5.62	4.77 4.71 7.90	3.32 5.22 7.13	4.00 2.90 2.98	7.49 8.36 6.62	13.42 14.46 4.22	1.08 0.57 4.85	0.11 0.06 0.00	42.88 41.26 39.64
1897 Means	0.00	0.00 0.16	0.97 0.31	1.77 0.46	ì	80.79 12.56	8.88 6.71	10.87 7.84	10.21	11.97 11.12	1.25	0.28	93.62 57.89

^{*}The estimated rainfall January to June, 1886, inclusive, was 21.97.

It is hoped to soon publish a complete record of the monthly and annual amounts of rain at Rivas for the period 1880–1897.

METEOROLOGICAL OBSERVATIONS AT RIVAS, NICA-RAGUA.

The records contributed for many years by Dr. Earl Flint, at Rivas, Nicaragua, include barometric readings. His present station is at 11° 26' N., 85° 47' W. The observations at 7:17 a.m., local time are simultaneous with Greenwich 1 p.m. The altitude of his barometer is 36 meters above sea level, but until the barometer has been compared with a standard it seems hardly necessary to publish the daily readings. The wind force is recorded on the Beaufort scale, 0-12. When cloudiness is less than 10, the letter "F," or "Few," is re-

On his forms for December Mr. Flint states that the total

during the eighteen years of his observations.

His station is situated on the western shore of Lake Nicaragua, not far from the eastern end of the western division of the Nicaragua Canal. The volcano Ometepe, on an island in Lake Nicaragua, is about 10 miles northeast of his station. Mr. Flint's records occasionally mention the presence of clouds in the early morning on the summits of this mountain.

Observations at Rivas, Nicaragua, March, 1898. OBSERVATIONS AT 7 A. M.

	Tempera- ture.		Wind.		Up	per el	ouds.	Lov	ouds.	ن ا	
Date.	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.	Daily rainfall.
1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 0 0 1 1 2 2 3 3 4 4 5 5 5 5 6 7 7 8 8 9 0 0 0 1 1 2 2 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 1 1 2 2 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 0 1 1 2 2 3 3 3 4 4 5 5 5 6 6 7 7 8 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 75 76 79 78 77 77 76 76 77 76 76 77 76 77 77 76 77 77	8336333633363336336356363638635656566666666	ne.	2 1 0 0 0 3 -5 5 3 2 4 2 -8 2 -8 2 2 1 1 1 1 2 2 1 1 1 1 2 2 1 1 1 1 1 2 2 1 1 1 1 1 2 2 1 1 1 1 1 2 2 1 1 1 1 1 2 2 1 1 1 1 1 2 2 1	c. c	Few 1 2 0 0 0 Few 10 0 0 0 0 0 0 0 0 0 0 0 0 2 5 5	SW. SW. SW. SW. ne. SW. ne. Sw.	ks. ck. ck. ck. ks. ks. ck. ck. ks. ks. ks. ks. ks. ks. ks.	0 10 8 10 10 10 10 10 10 10 10 10 10 10 10 10	ne.	0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

OBSERVATIONS AT 8 P. M.

	Tempera- ture.		Wi	nd.	Upper clouds.			Lower clouds.		
Date.	Air.	Dew-point.	Direction.	Force.	Kind.	Amount.	Direction from.	Kind.	Amount.	Direction from.
1	0 76 80 81 80 80 80 77 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 77 77 80 80 80 77 77 80 80 80 80 80 80 80 80 80 80 80 80 80	0 71 73 77 72 77 77 77 77 77 77 77 77 77 77 77	ne. se. se. se. se. ne. ne. ne. ne. ne. ne. ne. ne. ne. n	20013332111052122382222212211222	ck. c. ck. c.	0 0 0 10 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0	se. se. se. ne. ne.	ks.	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	86. 100.